



# PATENT SPECIFICATION

DRAWINGS ATTACHED

**1,174,902**

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## COMPLETE SPECIFICATION

### Improvements in and relating to Building Structures

We, ALAN WILLIAM DAVID MARSHALL and JOHN RICHARD WHEATLEY, both British Subjects, and both of Federal House, 2 Down Place, London, W.6, trading in Partnership

5 with others as ALAN MARSHALL AND PARTNERS, and REDPATH DONMAN LONG LIMITED, formerly Redpath Brown and Company Limited, a British Company, of 3 Duncannon Street, London, W.C.2, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 15 This invention relates to building structures and more particularly to the construction of the framework, floors and ceilings in multi-storey buildings.

20 A problem which commonly arises with conventional forms of building construction is that electrical, plumbing and heating pipes and ducts or like service elements have to be incorporated into a building after the main structure has been erected, and this may necessitate cutting or breaking open parts of the beams, floor and ceiling construction to accommodate the particular service and then making good after the latter has been incorporated. This procedure is often costly, and it is an object of the present invention to provide a form of building construction which simplifies the procedure for incorporating such services.

25 30 35 The invention accordingly consists in a method of erecting a steel-frame building structure which includes the steps of supporting a prefabricated reinforced concrete floor panel of open-work grid form across steel horizontal floor-bearing support beams of the frame to provide a platform and bonding the panel to said beams with concrete or like cementations bonding material.

40 The invention also consists in a steel-frame building structure having a prefabricated rein-

forced concrete floor panel of open-work grid form supported across steel horizontal beams of the frame and bonded thereto with concrete or like cementations bonding material.

40 45 The invention also consists in a method of erecting a steel-frame building structure which includes the steps of supporting a prefabricated reinforced concrete floor panel of open-work grid form across steel horizontal floor-bearing support beams of the steel frame to provide a working platform, then bonding the panel to the beams by filling the grid openings with concrete or like cementations material.

50 55 The invention also consists in a steel-frame building structure having a prefabricated reinforced concrete floor panel of open-work grid form supported across steel horizontal beams of the frame and the grid openings being filled with concrete or like cementations material to bond the panel to the beams.

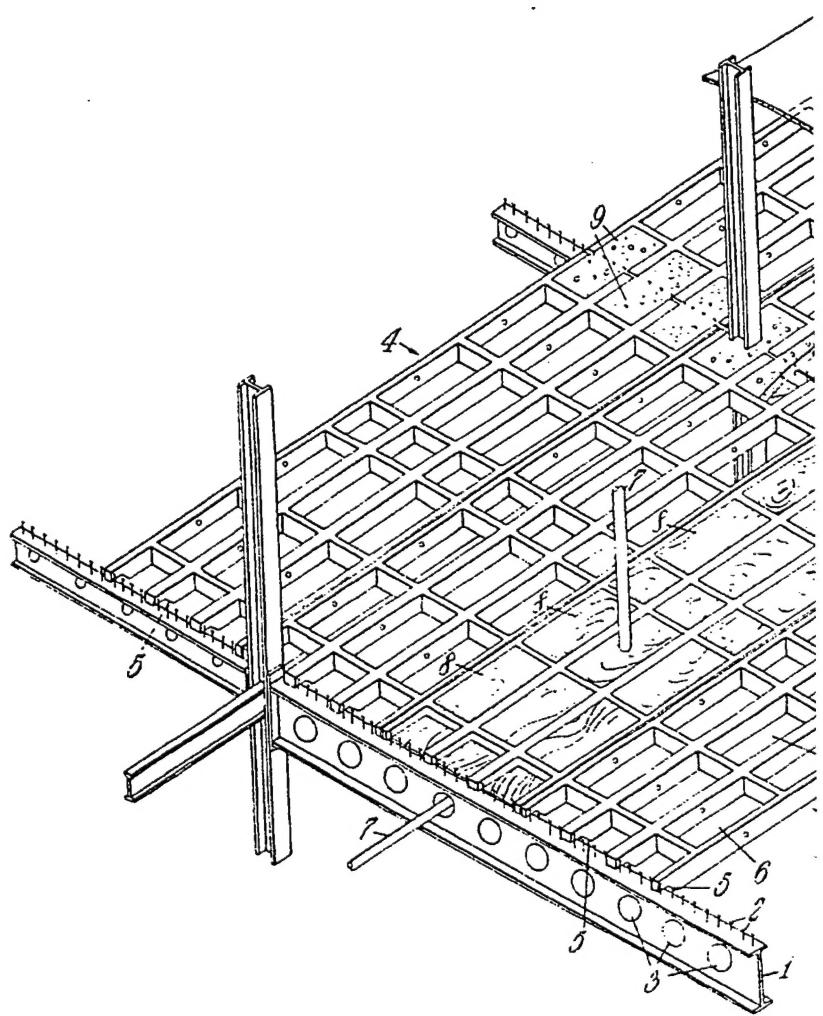
60 65 The beams which support the flooring grid are preferably provided with upstanding shear connector pins through which the grid is bonded to the beams by the concrete or like aggregate, and the beams themselves have openings in the vertical plane aligning with the grid openings further to facilitate the insertion of service pipes and the like. Conveniently the prefabricated reinforced concrete grid panels may be panels such as those described under the Registered Trade Mark "Grillcon."

70 75 This arrangement allows service elements to be incorporated into the structure before completion of a floor, through the openings in the grid without the necessity of knocking out holes for these and then making good. After all necessary service elements have been incorporated the floor structure can then be completed by suitably closing up the grid openings.

80 85 The invention will now be described by way of an example with reference to the accompanying drawing which is an isometric view

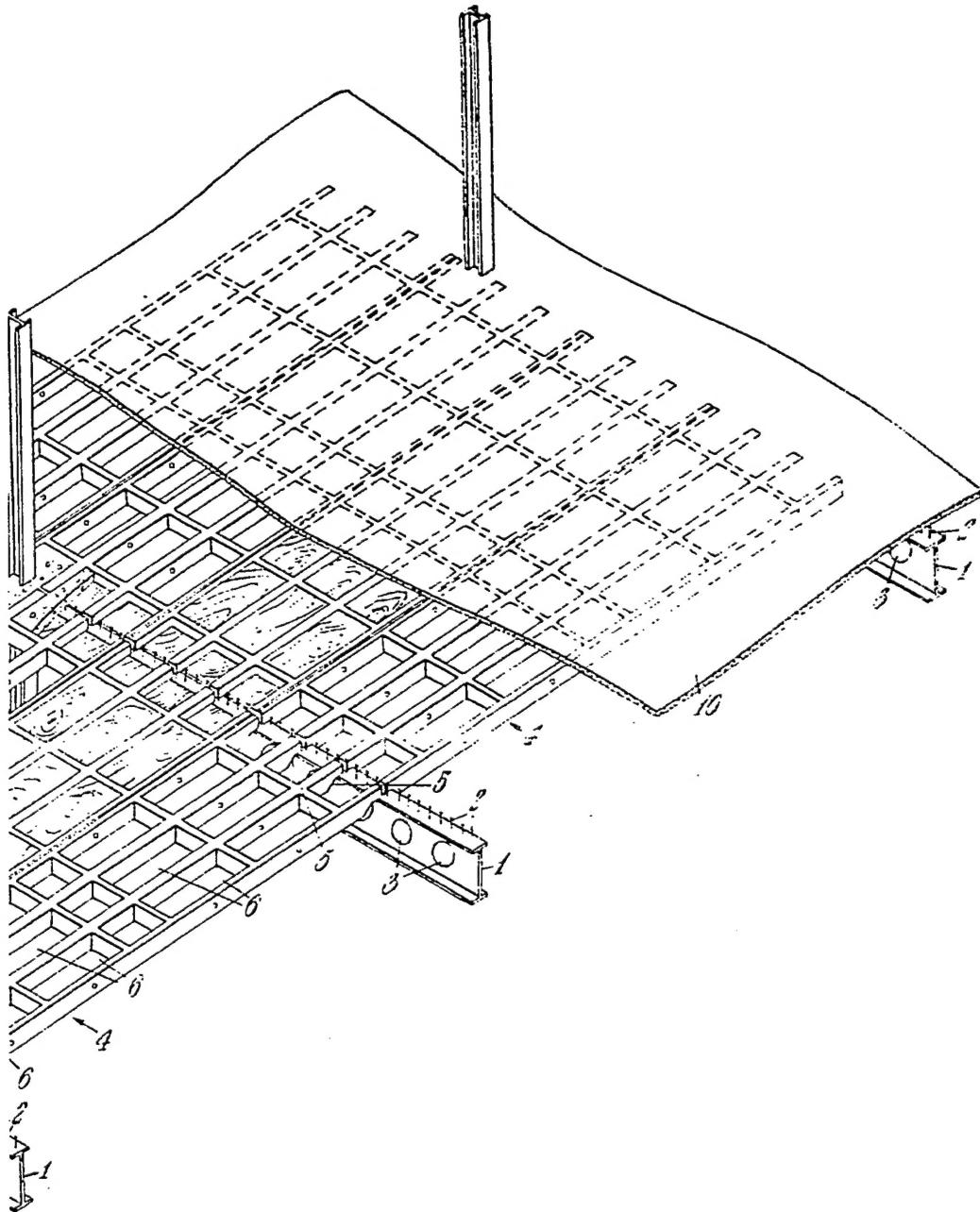
- of a part of a building showing different portions of a floor structure at different stages in its erection.
- Referring to the drawing, a building is erected by first constructing a steel supporting frame in known manner, the horizontal floor support beams 1 of which have a longitudinal row or rows of upstanding shear connector pins 2 on their upper surfaces, and a row of openings 3 in the vertical webs, and then laying prefabricated "Grillcon" or similar floor panels 4 over the floor support beams so that the ends of the panel ribs, which are of cut-out form, lie between the shear connector pins with their shoulders 5 adjacent the side of the beam and the holes in the vertical web of the beam aligning with the grid openings 6 of the panels. A working platform is thus provided which allows service pipes and the like to be incorporated in the structure as at 7 through the beam and grid openings before the floor itself is completed. This is then done by closing the floor grill openings with close fitting wood or like panels 8, the ribs of the grid having stepped profiles (not shown) so that each opening has retaining shoulders for the wood panels, and then filling the openings with concrete mix 9. The concrete mix poured into the openings at the ends of the panel at the support beams 1 binds with the shear connectors, thereby bonding the floor panels to the beams to form a strong composite beam structure, the wood panels in these floor panel openings being above the level of the vertical holes in the beam. The floor is then completed by an upper concrete screed 10 over the entire panel.
- The close fitting wood or like panels 8 have bolts (not shown) fixed on them on a 2-foot lateral grid in both directions to support surface pipes and/or ceilings on the underside of the floor construction.
- WHAT WE CLAIM IS:—**
1. A method of erecting a steel-frame building structure which includes the steps of supporting a prefabricated reinforced concrete floor panel of openwork grid form across steel horizontal floor bearing support beams of the frame to provide a platform and bonding the panel to the beams with concrete or like cementitious bonding material.
  2. A method of erecting a steel-frame building structure which includes the steps of supporting a prefabricated reinforced concrete floor panel of openwork grid form across steel horizontal floor bearing support beams of the
- frame to provide a working platform, then bonding the panel to the beams by filling the grid openings with concrete or like cementitious material.
3. A method according to either of the preceding claims, in which the panel is bonded by concrete or like cementitious bonding material to said beams through shear connector pins attached to the beams.
4. A method as claimed in any of the preceding claims, in which a service element is incorporated into the structure through one of the grid openings before the floor is completed.
5. A method as claimed in any of the preceding claims wherein a concrete screed is laid over the grid after the openings have been filled.
6. A steel-framed building structure having a prefabricated reinforced concrete floor panel of openwork grid form supported across steel horizontal beams of the frame and bonded thereto with concrete or like cementitious bonding material.
7. A steel-framed building structure having a prefabricated reinforced concrete floor panel of openwork grid form supported across steel horizontal beams of the frame, the grid openings being filled with concrete or like cementitious material to bond the panel to the beams.
8. A structure according to either of claims 5 or 6, in which the panel is bonded by concrete or like cementitious bonding material to said beams through shear connector pins attached to the beams.
9. A structure according to any of claims 5 to 7, in which the beams have vertical webs with holes therein aligning with the grid openings.
10. A structure as claimed in any of claims 5 to 8, incorporating a service element fitting through one of the grid openings.
11. A structure as claimed in any of claims 5 to 10 including a concrete screed over the grid.
12. A method of erecting a steel-framed building structure substantially as herein described with reference to the accompanying drawings.
13. A steel-frame building structure substantially as herein described with reference to the accompanying drawings.

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